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Annual Forecast of
Alberta School Enrolments
1978 ~ 1987

A Summary

prepared by
Enrolment Projections Committee
Fall, 1978

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ANNUAL FORECAST OF ALBERTA SCHOOL ENROLMENTS

A SUMMARY

Background

In the Spring, 1977, a departmental study group was charged with projecting Alberta school enrolments for 1977 and 1978, developing a 10-year enrolment projection for planning purposes, and, at the same time, building a reliable in-house, enrolment forecasting capability. The results of their work are reported in Alberta Short-and-Medium-Range Pupil Enrolment Projections 1977-86 (an abstract of the report appears on page 1 of Planning and Research's Annual Research Highlights 1977-78, September, 1978).

This Summary is an extension and refinement of the 1977 work. Again, a 10-year forecast horizon is used -- this time, 1978 to 1987. Enrolment projections are reported as province-wide totals by grade. Main techniques employed are Cohort Progression and Participation Rate.

It is intended that the Annual Forecast be issued yearly, in the Fall. While this particular Summary is devoted to province-wide enrolments only, future Forecasts will focus on regional and district-level enrolments as well.

Data Sources and Methodology

1. Data Sources

While the 1977 project relied on many data sources, due to the unavailability of any up-to-date summary publication on live birth projections, mortality and migration forecasts, in 1978 only two data sources were required: 1) departmental records, and 2) Alberta Population Projections 1977-2006, Alberta Treasury (Bureau of Statistics).

a) Departmental Records

Annual Report summaries of Form A0304-320 A, "Alberta Education Report on Enrolment for the Month of September", provided age, grade and sex distributions of the Provincial school populations for the years 1961, 1966, 1971 and 1976.

b) Population Projections 1977-2006

The Populations Projections 1977-2006 are a set of several series of Alberta population forecasts prepared by the Alberta

Bureau of Statistics in cooperation with the interdepartmental Population Projections Committee (Alberta Education is represented on this committee).

Nine series of projections were produced using a components approach, involving "Low", "Medium" and "High" fertility assumptions and three distinct migration assumptions. The projections are reported by single year of age and sex for each year as of June 1.

Only two of these series have been used for this school enrolment Forecast: Series 4 (Medium Fertility and Migration Set C) and Series 1 (Low Fertility and Migration Set C), (Series 4 was endorsed by the Population Projections Committee for departmental short-range planning purposes).

Migration

Under the *migration* assumptions of Set C, positive net migration to Alberta will rise beyond the average of 38,800 in the last three years, to a maximum of 56,000 persons in 1982-83, in response to construction throughout Alberta of large-scale industrial projects, and will decrease to 34,000 by 1986-87, as these same projects become operational (see Table 1).

The age distribution of net migrants was derived from comparisons between projected ABS 1976 total population and 1976 Census counts.

Medium Fertility

According to projection Series 4, Alberta *fertility* rates (measured by Total Fertility Rate) will stabilize at the 1974 level -- 2.109 births per woman ages 15 - 49 years -- through the projection period (see Table 1).

Low Fertility

Series 1 anticipates a continuing decline in fertility, below the "medium" 1974 fertility rate, from 2.047 births per woman (ages 15 - 49 years) in 1978 to 1.914 births per woman by 1985. The rate is assumed to stabilize at the 1985 level in 1986 and 1987, the remainder of the enrolment projection period (see Table 1).

2. Methodology

a) Components Approach

Two cohort progression methods were used again in 1978. The

TABLE 1

LOW FERTILITY¹

	<u>TFR*</u>		<u>TFR</u>
1978	2.047	1983	1.952
1979	2.027	1984	1.933
1980	2.007	1985	1.914
1981	1.987	1986	1.914
1982	1.971	1987	1.914

MEDIUM FERTILITY²

	<u>TFR</u>		<u>TFR</u>
1978	2.109	1983	2.109
1979	2.109	1984	2.109
1980	2.109	1985	2.109
1981	2.109	1986	2.109
1982	2.109	1987	2.109

MIGRATION³

	<u>Net Migration</u>		<u>Net Migration</u>
1978	34,000	1983	50,000
1979	37,000	1984	38,000
1980	45,000	1985	36,000
1981	52,000	1986	34,000
1982	56,000	1987	34,000

*Total Fertility Rate - births per woman

¹fertility assumptions of Series 1, Population Projections Alberta 1977-2006, Alberta Treasury, 1978

²fertility assumptions of Series 4, Population Projections

³migration assumptions of both Series 1 and Series 4, "Migration Set C", Population Projections

Age-Cohort Progression (AP) method involves estimating the progression of the base year school population (enrolment reported September 30, 1977) by single year of age and adding net migration. Projections by grade for 1978-87 are obtained by apportioning the age-distributed school population according to ratios of those: in the modal grade, above the modal grade, below the modal grade, and in opportunity classes.

Beginner enrolments for the years 1978 through 1981 are set in relation to their actual 1976 age cohort. For 1982 through 1987, beginners are taken as a function of Series 1 and Series 4 projected Age 5 and Age 6 populations.

The *Grade Cohort Progression* (GP) method applies representative grade-to-grade transfer rates to the September 30, 1977 grade enrolments.

Beginner enrolments are set at 115% of live births six years previously for each of the years 1978 through 1983. For years 1984-87, the number of beginners is projected on the basis of the June 1st Age "0" populations forecast by Series 1 for the years 1978 to 1981.

b) Extrapolative Methods

A *Markov Model* was used in the 1977 enrolment study. The conclusion then was that further refinement was required. The Markov model was not employed in the 1978 forecasting since that needed refinement has not yet been carried out.

Similarly, none of the several linear and non-linear *mathematical* specifications tested were judged satisfactory when compared with results obtained from the cohort progression or the participation rate methods.

c) Ratio Methods

The *Participation Rate* (PR) method takes all those persons of eligible school age expected in some future year and assigns them by single year of age to specific grades. Here, age-specific grade participation rates were projected for 1978-87 using linear regression on values observed in the years 1961, 1966, 1971 and 1976, and applied to Series 4 and Series 1 forecasted populations of ages 5 to 21 inclusive.

Projected Enrolments

For clarity, the enrolment projections are characterized here not by the assumptions underlying them [Low or Medium Fertility; Low or Medium Migration], nor by the projection methods they employ [Age-Cohort

(AP) or Grade-Cohort (GP) Progression, or Participation Rate (PR)], but by the results they obtain. The "High" and "Low" projections in Table 2 and in Figures 1 and 2 describe the range within which the actual future enrolments are expected to lie. The "Central" projection is the series, which in the view of the Enrolment Projections Committee, defines the single most likely path of future in-school populations.

All projections are made and reported as of September 30 in each year.

Results

Total Enrolments. All 3 projection series anticipate a continuing modest decline in Alberta total enrolments to a minimum in 1980 or in 1981 of some 1% to 2% below present enrolment levels. Total enrolments should recover thereafter to reach a 10-year maximum in 1987 approximately 108% to 119% of the 1981 enrolment "low".

Elementary Enrolments. Elementary enrolments will continue to rise through the projection period*, reaching a level in 1987 18% to 33% above the 1978 Grades 1 to 6 totals.

Junior High Enrolments. The number of junior high school students will rise from a 1980, 10-year low, to a high in 1987 of from 112,100 to 119,300.

Senior High Enrolments. The differences in the results among the three projection series are most obvious at the senior high school level. The "High" projection expects senior high enrolments to reach their lowest level in 1981, but to grow in the remaining years of the projection period to 102% of the September, 1978 enrolment.

The "Low" series foresees a fluctuating enrolment, with 1987 senior high enrolment 7.5% below present day levels.

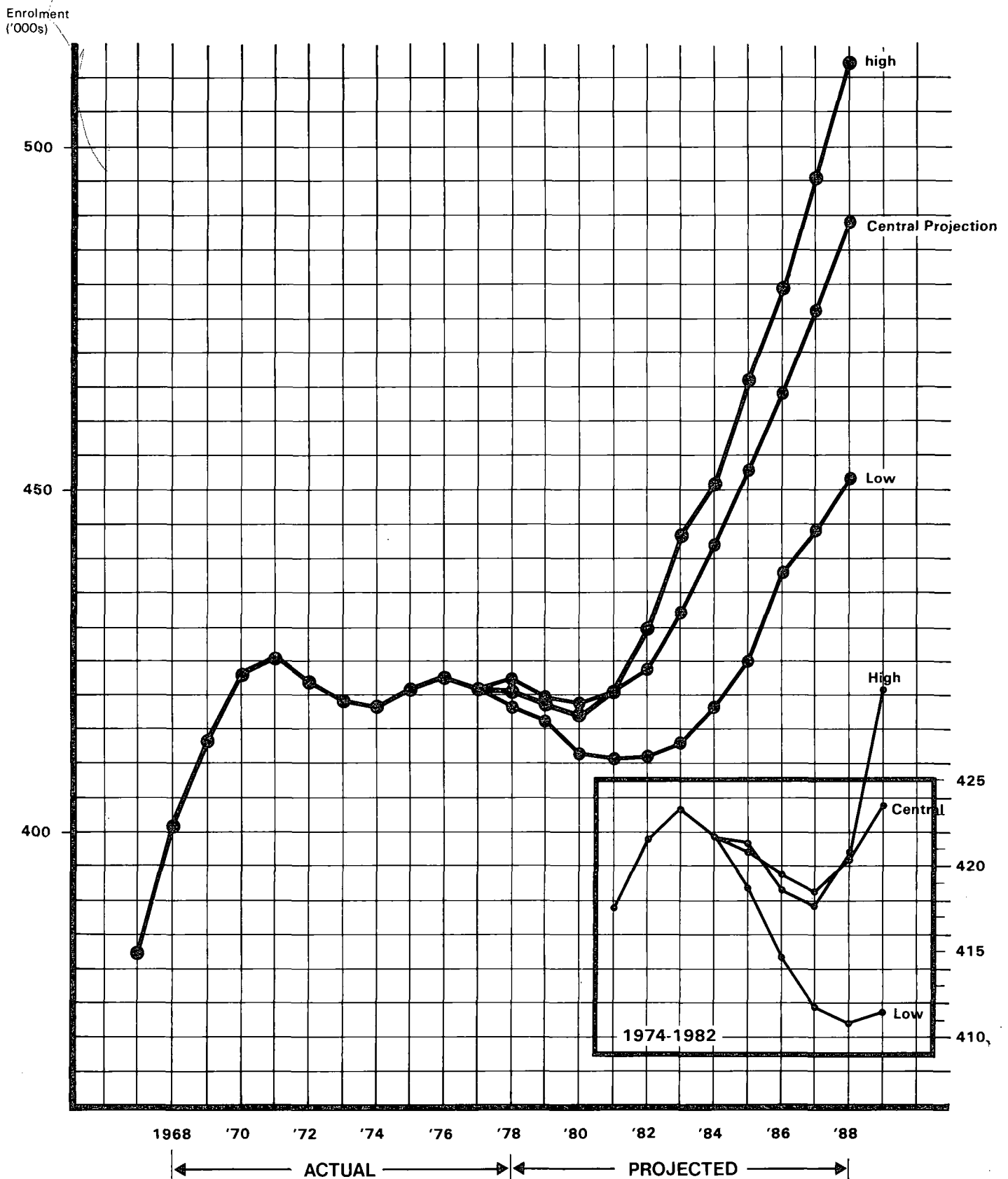
According to the "Central" projection, senior high enrolment will fall to a minimum by 1983, and increase from 1984 through 1987 to 102,500 students -- almost 4% lower than the expected 1978 total.

1978 and 1979

Enrolments this year (September 30, 1978) are expected to total 420,938: 204,414 elementary, 110,357 junior high, and 106,167 senior

* The only exception: according to the "High" series, a slight decline from the 1978 level will occur in 1979, with recovery following in 1980. See Figure 2.

Figure 1
Alberta Total School Enrolments



- Notes:
1. "High" Projection: PR method using Medium Fertility/Migration assumptions of ABS Series 4.
 2. "Central" Projection: AP method using Low Fertility/Migration assumptions of ABS Series 1.
 3. "Low" Projection: GP method using Low Fertility/Migration assumptions of ABS Series 1.

TABLE 2
PROJECTED ALBERTA SCHOOL ENROLMENTS
(Fall, 1978)

"HIGH"

	<u>TOTAL</u>	<u>ELEMENTARY</u>	<u>JUNIOR HIGH</u>	<u>SENIOR HIGH</u>
1978	421,620	204,077	108,988	108,535
1979	418,525	202,708	106,513	109,304
1980	417,934	205,454	105,299	107,181
1981	420,644 ⁷⁷¹	209,741	106,972	104,058
1982	430,160 ⁷⁵⁶	216,064	110,079	104,613
1983	443,173 ⁴⁵²⁷⁴¹	225,915	112,782	105,562
1984	451,576 ⁴⁴⁴²⁵⁷	233,524	114,124	105,093
1985	465,802 ⁴⁶⁸³²⁰	246,953	114,348	107,019
1986	480,580 ⁴⁸³⁷⁷¹	258,595	115,866	109,450
1987	495,794 ⁵⁰⁰⁰⁶³	270,622	119,277	110,164

"CENTRAL"

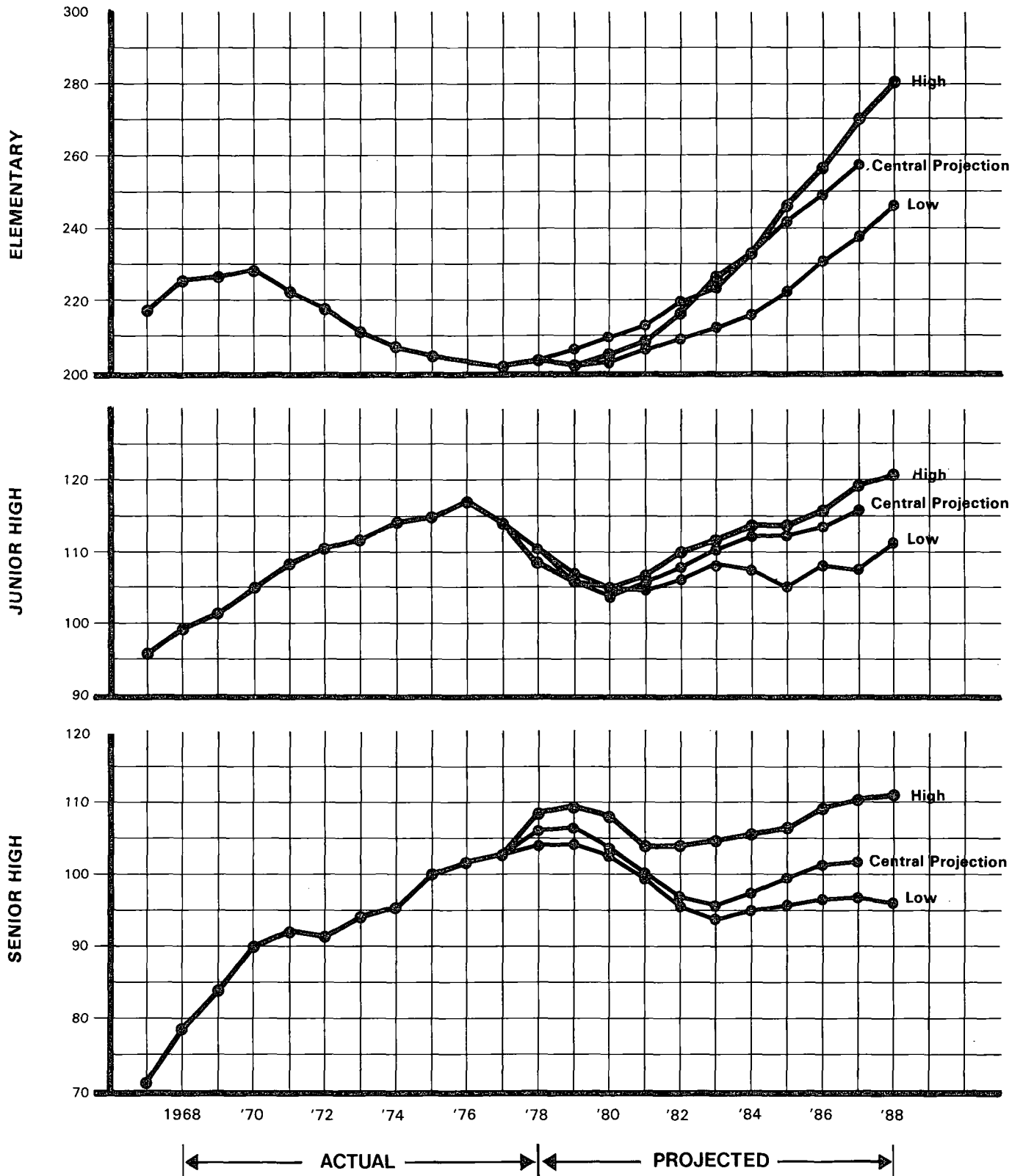
1978	420,938	204,414	110,357	106,167
1979	419,330	206,258	106,321	106,751
1980	418,493	209,021	104,861	104,611
1981	420,369	213,560	105,998	100,811
1982	423,772	217,775	108,443	97,554
1983	432,222	224,673	110,917	96,632
1984	442,931	233,001	112,128	97,802
1985	453,698 ⁴⁴⁸⁶⁹⁵	241,262	112,511	94,925
1986	464,916	249,620	113,460	101,836
1987	476,466	258,148	115,774	102,544

"LOW"

1978	418,484	203,838	109,739	104,907
1979	414,506	203,381	106,219	104,906
1980	411,979	204,167	104,574	103,238
1981	410,623	206,319	105,156	99,148
1982	411,064	208,513	106,664	95,887
1983	413,339 ⁵	210,774	108,147	94,414
1984	418,773	216,250	107,546	94,977
1985	425,312	223,414	105,461	96,437
1986	438,200	231,750	108,774	97,676
1987	444,460	239,881	107,573	97,006

NOTES: 1) "High" Projection: PR method using Medium Fertility/Migration assumptions of ABS Series 1
 2) "Central" Projection: AP method using Low Fertility/Migration assumptions of ABS Series 1
 3) "Low" Projection: GP method using Low Fertility/Migration assumptions of ABS Series 1

Figure 2
Alberta School Enrolments, by Grade Level



high school students. In 1979, enrolments will reach 419,330 in total: 206,258 at the elementary level, 106,321 and 106,751 at the junior high school and senior high school levels respectively (*1978 Central Projection*).

Enrolment Projections Committee
Fall, 1978

EDITORS NOTE: A preliminary count of September, 1978 enrolments became available just as this Forecast was going to press. Enrolled in Alberta school as at September 30 were approximately 204,238 elementary school students, 109,676 junior high school students, and 104,553 senior high school students, Total: 418,467. This compares with the 'central' series projection above of some 0.6% higher or 420,938.

